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ORBITAL PARAMETERS OF SIX SPECTROSCOPIC BINARY CEPHEIDS

Our observations of Cepheid radial velocities using a CORAVEL-type photoelectric correlational spectrometer (Tokovinin, 1987) started in 1987. The results for 1987–1991 were presented in the form of a catalog of Cepheid radial velocities (Gorynya et al., 1992a). This catalog contains about 1500 observations of nearly 80 galactic Cepheids. Our observations were continued, and in 1992–1994 we obtained more than 2100 radial velocity measurements for 87 Cepheids. Thus, our data base of original accurate (typical r.m.s. error about 0.5 km/s) radial velocity measurements contains more than 3600 observations for 107 Cepheids. We have also compiled a data base of all published radial velocity measurements for Cepheids; for Cepheids of our programme, this data base quotes a little more than 3800 observations. Our programme aims to gather good coverage of radial velocity curves, optimally for each year of observations of a star. As the result, these data are well suited for the search and study of spectroscopic binary Cepheids. It is well known that spectroscopic binarity is a common phenomenon among classical Cepheids (Szabados, 1995).

We were able to confirm a number of earlier known spectroscopic binaries. Moreover, we have discovered several new ones: MW Cyg (Gorynya et al., 1992b), VZ Cyg (Samus et al., 1993), BY Cas (Gorynya et al., 1995).

The present paper is devoted to new determinations of orbital elements for six Cepheids with long series of radial velocity measurements available. We used our measurements along with published data extracted from our data base.

In calculations of orbital elements the pulsational curve was approximated by trigonometrical series of the order from 1 to 5, with light elements taken from our data base. The search for orbital periods used our standard software for analyzing periodicities of variable stars. The quality of approximation may be seen in the orbital and pulsational radial velocity curves presented in Figures 1a-b. We ascribed to each data point (both in the orbital and the pulsational curves) half of individual residual of radial velocity.

Table 1 presents the results of our computation of orbital elements. N and n are respectively the total number of velocity observations used and the number of our original velocity measurements for each star. We estimate the error of orbital periods as $\pm 3 - 5$ days, that of pericenter epochs, as ± 10 days, that of orbital eccentricities, as ± 0.02, that of V_γ, as ± 0.5 km/s.

Table 1
New Orbital Elements for 6 Cepheids

	FF Aql	BY Cas	VZ Cyg	MW Cyg	S Sge	V350 Sgr
T_0, JD 24...	45381	49384	49294	47997	48687	49103
P_{orb}, d	1433	563	725	441	676	1467
e	0.09	0.22	0.05	0.04	0.18	0.31
ω, deg	327	288	332	91	202	292
V_γ, km/s	–16.0	–58.7	–15.1	–12.8	–9.6	+11.2
K, km/s	+5.0	+9.1	+6.5	+5.8	+15.4	+10.3
$f(M)$	0.018	0.040	0.020	0.009	0.243	0.142
N	162	14	67	180	200	135
n	69	14	58	131	83	79

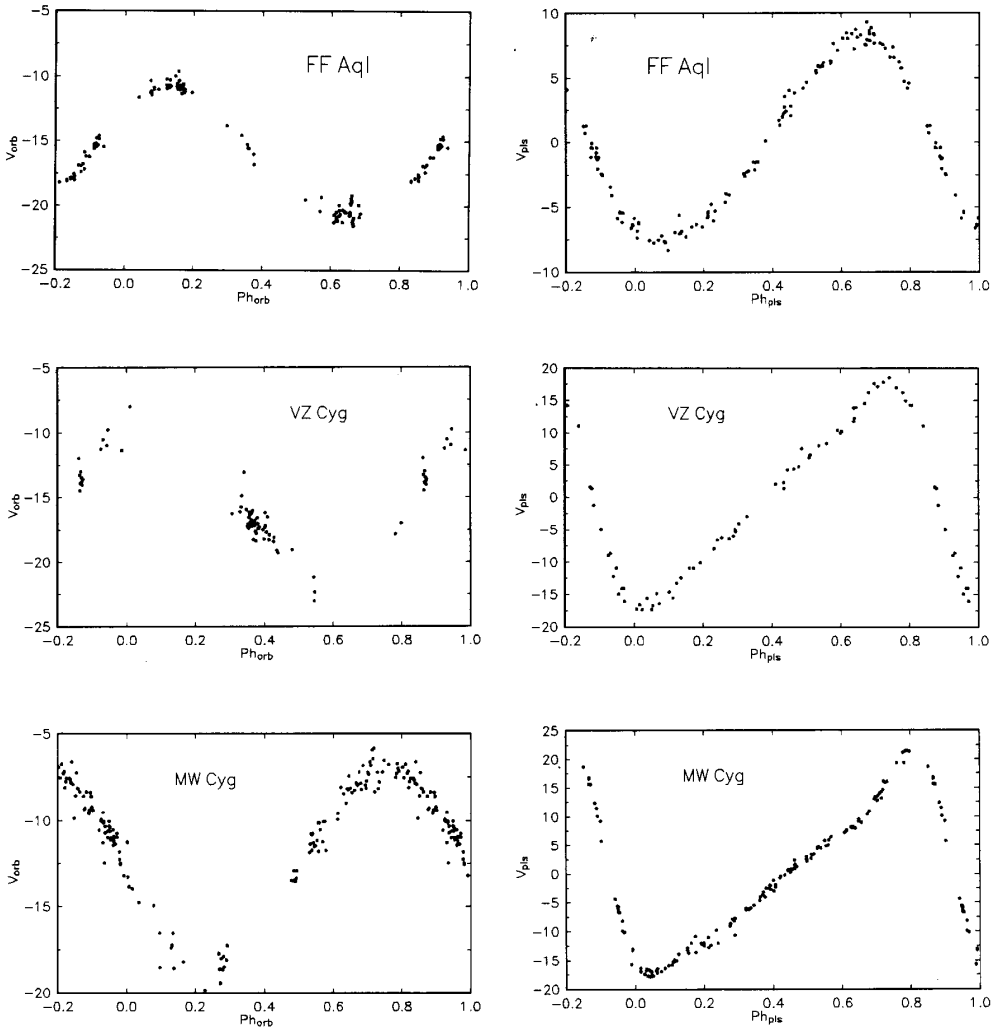

Figure 1a. FF Aql, VZ Cyg, MW Cyg – decomposition of the radial velocity data into orbital (left) and pulsational (right) components.

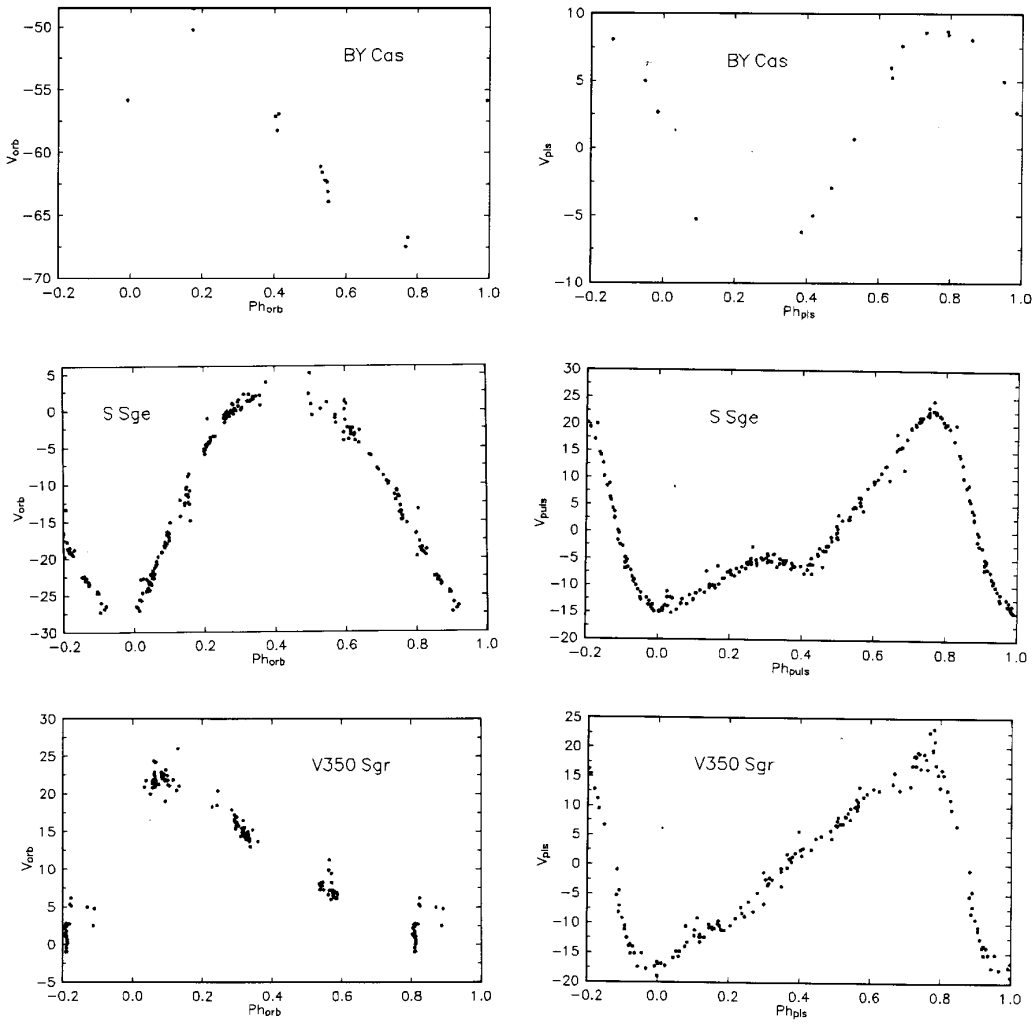

Figure 1b. BY Cas, S Sge, V350 Sgr – decomposition of the radial velocity data into orbital (left) and pulsational (right) components.

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